

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450**

Appl No.:	10/509,985	Confirmation No. 2960
Applicant:	Fareed Kureshy	
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TC/A.U.:	1609	
Examiner:	Owens, Garrison A.	
Docket No.:	100788.0010US	
Customer No.:	24392	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

Sir:

In response to the Office action of June 13, 2007, please amend the above-identified application as follows:

Amendments to the Specification - None -

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Amendments to the Drawings - None -

Remarks/Arguments begin on page 6 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An analytic system for optical detection of a plurality of analytes that are bound to a biochip, the analytic system comprising:
a platform functionally coupled to a confocal microscope detector and movable along an x-coordinate, a y-coordinate, and optionally a z-coordinate relative to the detector, wherein the platform is configured to receive a biochip;
wherein the biochip has a plurality of registration markers ~~marker~~ and further has a plurality of analytes in predetermined positions relative to the registration markers ~~marker~~;
a first light source that is configured to illuminate ~~illuminates~~ the registration markers ~~marker~~ at a first angle to generate [[a]] registration marker signals ~~signal~~, and further comprising a second light source that is configured to sequentially illuminate ~~illuminates~~ at least two ~~[[one]]~~ of the plurality of analytes at a second angle to generate [[an]] at least two individual analyte signals, respectively; and
a computer configured to determine the position of the at least two analytes with respect to at least the x-coordinate and the y-coordinate using the predetermined relationship of the plurality of registration markers to the plurality of analytes; and wherein the first and the second angles are different.
~~wherein a focal position for detection of the analyte signal by the detector is determined by the analytic system using the registration marker signal.~~
2. (Original) The analytic system of claim 1 wherein the detector comprises an objective lens or an objective lens system with a numeric aperture that is sufficient to allow detection of the analyte signal without moving the platform along the z-coordinate.
3. (Original) The analytic system of claim 1 wherein the first light source has a wavelength maximum that is different from an absorption maximum of an optically detectable label of the at least one of the plurality of analytes.

4. (Original) The analytic system of claim 1 further comprising a third light source that illuminates the at least one of the plurality of analytes or another one of the plurality of analytes to generate a second analyte signal, and wherein the third light source has a wavelength maximum that is different from both, the wavelength maximum of the first light source and the absorption maximum of an optically detectable label of the at least one of the plurality of analytes or another one of the plurality of analytes.
5. (currently amended) The analytic system of claim 1 wherein the registration marker and the at least one of the analytes are illuminated at a different angle and a different wavelength by the first and the second light source, respectively.
6. (Original) The analytic system of claim 1 wherein the first light source is a laser or a light emitting diode, and wherein the second light source is a laser.
7. (Original) The analytic system of claim 1 wherein the registration marker comprises a fluorescent dye, a luminescent compound, a phosphorescent compound, or a reflective compound.
8. (Original) The analytic system of claim 1 wherein the analyte signal is a fluorescence signal, a chemiluminescence signal, or a phosphorescence signal.
9. (Original) The analytic system of claim 1 wherein the detector comprises a photo-multiplier tube or a charge-coupled device.
10. (currently amended) The analytic system of claim 1 further comprising a second and a third registration marker, and wherein the a vertical focal position for detection of the analyte signals signal by the detector is determined by the analytic system using registration marker signals from the registration marker, the second registration marker and the third registration marker.
11. (Original) The analytic system of claim 1 wherein the analyte signal is normalized by the analytic system using a positive control marker on the biochip.

12. (Original) The analytic system of claim 1 further comprising a data transfer interface electronically coupled to the detector.
13. (currently amended) The analytic system of claim 12 wherein the data transfer interface is informationally coupled to ~~provides data to~~ a computer in a remote location.
14. (Withdrawn) An analytic system for micro-optical analysis of a biochip, the analytic system including a first light source and a second light source, wherein the first light source illuminates a registration marker on the biochip to provide a registration marker signal, wherein the second light source illuminates an analyte to provide an analyte signal, and wherein a focal position for detection of the analyte signal with a confocal microscope is determined using the registration marker signal.
15. (Withdrawn) The analytic system of claim 14 wherein the analyte signal has a round shape with a diameter of no more than 500 micrometer.
16. (Withdrawn) The analytic system of claim 15 wherein a test result is calculated from an average signal value of a portion of the round shape.
17. (Withdrawn) The analytic system of claim 14 further comprising a third light source illuminating the analyte to generate a second analyte signal.
18. (Withdrawn) An analytic system for optical analysis of a biochip, the analytic system comprising a first optical subsystem that uses a first light source that illuminates a registration marker on the biochip, and a first detector that detects a registration marker signal, and the system further comprising a second optical subsystem that uses a second light source that illuminates a probe or analyte on the biochip, and a second detector that detects a probe or analyte signal, wherein the first subsystem is used to determine a focal position for detection of the probe or analyte signal using the registration marker signal, and wherein the second subsystem is used to quantify the probe or analyte signal.
19. (Withdrawn) The analytic system of claim 18 wherein a platform receives the biochip, and wherein the biochip is moved into the focal position by moving the platform along an x-coordinate and a y-coordinate.

20. (Withdrawn) The analytic system of claim 19 wherein the biochip is moved into the focal position without moving the biochip along an z-coordinate.

REMARKS/ARGUMENTS

Oath/Declaration

The office deemed the oath/declaration to be defective for lack of providing corrections labeled with initials and a date. The applicant notes that the declaration as originally filed was changed and initialed at the time of signature. Thus, no additional dating of the change was provided as the date of signature and the change was the same.

35 USC § 112, second paragraph

Claims 1-13 were rejected under 35 USC § 112, second paragraph, as failing to establish metes and bounds for use of the term “coupled”. While the applicant respectfully disagrees, claim 1 was amended to specify the term as “functionally coupled”.

The office further rejected claims 1-13 as being incomplete for failing to point out the structural interrelation between “the second energy source and second energy detector”. It is unclear to the applicant where these recited elements would be in the presently pending claims. Clarification is respectfully requested.

35 USC § 102(b)

Claims 1-13 were rejected under 35 USC § 102(b) as being anticipated by Noblett et al. (U.S. Pat. No. 6,471,916). The Applicant respectfully disagrees, especially in view of the amendments herein.

As amended, claim 1 and claims 2-13 by virtue of their dependence on amended claim 1 expressly require “...a *first light source that is configured to illuminate the registration markers at a first angle* to generate registration marker signals, and further comprising a *second light source that is configured to sequentially illuminate at least two of the plurality of analytes at a second angle* to generate at least two individual analyte signals, respectively...”, wherein the “...*first and the second angles are different...*”

All amended claims further expressly require “...a *computer configured to determine the position of the at least two analytes with respect to at least the x-coordinate and the y-*

coordinate using the predetermined relationship of the plurality of registration markers to the plurality of analytes...

It is well established that anticipation under 35 U.S.C. § 102 requires the presence in a single prior art disclosure of ***each and every element of a claimed invention***. *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 U.S.P.Q.2D (BNA) 1051, 1053 (Fed. Cir. 1987); *Carella v. Starlight Archery*, 804 F.2d 135, 138, 231 U.S.P.Q. (BNA) 644, 646 (Fed. Cir.), *modified on reh'd*, 1 U.S.P.Q.2D (BNA) 1209 (Fed. Cir. 1986); [**7] *Jamesbury Corp. v. Litton Indus. Prods., Inc.*, 756 F.2d 1556, 1560, 225 U.S.P.Q. (BNA) 253, 256 (Fed. Cir. 1985); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458, 221 U.S.P.Q. (BNA) 481, 485 (Fed. Cir. 1984); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548, 220 U.S.P.Q. (BNA) 193, 198 (Fed. Cir. 1983).

Clearly, the '916 reference is entirely devoid of any teaching or suggestion of separate first and second light sources that are configured to illuminate the registration markers and analytes, respectively, to generate respective registration marker and analyte signals. All Noblett teaches is that excitation radiation source may be configured to provide excitation light of at least two wavelengths. However, separate illumination of separate entities with separate light sources (at distinct angles) to generate separate and distinct signals is clearly not present.

Even if one would argue that Noblett's device could be used to provide separate illumination events (which would be entirely unsupported), such illumination is still not at distinct angles as can be taken, *inter alia*, from Figure 1. As anticipation under Section 102 also requires "the presence in a single prior art disclosure of all elements of a claimed invention ***arranged as in that claim.***" *Panduit Corp. v. Dennison Manufacturing Co.*, 774 F.2d 1082, 1101, 227 U.S.P.Q. (BNA) 337, 350 (Fed. Cir. 1985) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548, 220 U.S.P.Q. (BNA) 193, 198 (Fed. Cir. 1983)), anticipation cannot be properly established.

Moreover, amended claim 1 further requires a computer that is configured to determine the position of the at least two analytes with respect to at least the x-coordinate and the y-coordinate using the predetermined relationship of the plurality of registration markers to the

plurality of analytes. In contrast, Noblett teaches focal determination by imaging the mark (*e.g.*, column 5, lines 15-24) and positional feedback by imaging the test surface (*e.g.*, column 5, lines 27-33). In other words, Noblett uses an image of the array to determine the analyte position, which is contrary to the claimed subject matter. Therefore, and at least for the above reasons, claims 1-13 should not be deemed anticipated.

With further regard to **claim 2** and the examiner's assertion that the detector would have an objective lens with a numeric aperture that is sufficient to allow detection of the analyte signal without moving the platform along the z-coordinate, the examiner's rationale is not well taken. Yes, Noblett has an objective lens 31, however, nothing can be learned from the description that this lens has a numeric aperture that is sufficient to allow detection of the analyte signal without moving the platform along the z-coordinate. It is pointed out that the numerical aperture for a lens is a dimensionless number that identifies the range of angles over which the lens can receive or emit light. This is entirely inconsistent with aperture stop 34 cited by the office, which merely limits the amount of light that is allowed to reach the photomultiplier.

With further regard to **claim 3** and the examiner's assertion that the Noblett would teach that the first light source would a wavelength maximum that is different from an absorption maximum of an optically detectable label of the at least one of the plurality of analytes, the applicant once more disagrees. The examiner points to column 4, lines 11-16 to support his position. However, that very passage merely teaches that the emitted light from the fluorophore has a longer wavelength than the incident light. Thus, the examiner's position is entirely unfounded.

With further regard to **claim 4**, the examiner's argument that Noblett would teach capability of the illumination head to emit radiation of three or more different wavelengths and therefore would anticipate the limitations of "...a third light source that illuminates the at least one of the plurality of analytes or another one of the plurality of analytes to generate a second analyte signal, and wherein the third light source has a wavelength maximum that is different from both, the wavelength maximum of the first light source and the absorption maximum of an optically detectable label of the at least one of the plurality of analytes or another one of the

plurality of analytes...” is not well taken. Among other things, no further specific reference to the third wavelength is given.

With further regard to **claim 5**, the examiner points to column 4, lines 16-24 and contends that Noblett would teach that the registration marker and the at least one of the analytes are illuminated at a different angle by the first and the second light source, respectively. Nothing is further from this assertion. First, only one excitation source is provided. Second, if anything, it is the angles of the incident and emitted light that are different. Third, amended claim 5 further requires that first and second light sources have different wavelengths, which is also neither taught nor suggested.

With further regard to **claim 7**, the examiner points to column 5, lines 37-39 and contends that Noblett would teach that the registration marker would comprise a fluorescent dye. This is again not well taken as the cited passage discusses the nature of dilution spots, which are inconsistent with registration markers.

With further regard to **claim 10**, the examiner points to column 5, lines 15-23 and asserts that Noblett would teach a second and a third registration marker, wherein the vertical focal position for detection of the analyte signal by the detector is determined by the analytic system using registration marker signals from the registration marker, the second registration marker and the third registration marker. Such assertion is again incorrect as Noblett teaches in that passage that a marking 105 or a user-applied fiducial mark 106 is imaged. Clearly, items 105 or 106 will not qualify as three registration markers.

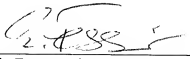
With further regard to **claim 13**, the examiner indicated that the claim limitation would be drawn to intended use. The applicant agrees and amended claim 13 accordingly.

REQUEST FOR ALLOWANCE

Claims 1-13 are pending in this application and claims 14-20 are withdrawn. The applicant requests allowance of all pending claims.

Respectfully submitted,

FISH & ASSOCIATES, PC

By 
Martin Fessenmaier, Ph.D.
Reg. No. 46,697
Tel.: (949) 253-0944